IN THE CLAIMS

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

PENDING CLAIMS

1. (PREVIOUSLY PRESENTED) An information processing apparatus for displaying an information object in a virtual space according to visual field data, where the information object represents one or more respective linked content items of different content types, and where said visual field data defines a visual field in said virtual space, said apparatus comprising:

holding means for holding, in an executable manner, a plurality of intermediate data generating means specific to said respective linked content items of different content types of the information object for generating respective pieces of intermediate data specific to a content type of a particular linked content item of the information object, said generated piece of intermediate data comprising at least either of texture data or display form defining data, and for holding, in an executable manner, a plurality of different display image generating means specific to said respective linked content items of different content types of the information object for generating respective display images from said respective generated pieces of intermediate data;

first means for causing said plurality of intermediate data generating means to generate the respective pieces of intermediate data for displaying a particular linked content item of the information object, according to a geometric relation between said visual field and said particular linked content item of the information object;

a memory for storing the generated pieces of intermediate data for rendering a display image; and

second means for causing said plurality of different display image generating means to generate display images of said particular linked content item of the information object from said respective generated pieces of intermediate data, to render the display image on a display

memory region, according to the geometric relation between said visual field and said particular linked content item of the information object.

2. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein each intermediate data generating means and each display image generating means operate asynchronously with each other for a respective content type of a particular linked content item of the information object.

3. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein each intermediate data generating means operates under control of said first means, to generate and renew a piece of intermediate data for displaying a particular linked content item of the information object, and each display image generating means operates simultaneously with each respective intermediate data generating means for the particular linked content item of the information object, under control of said second means, to generate a display image of the particular linked content item of the information object from said generated and renewed piece of intermediate data.

4. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein said holding means holds a plurality of information object content type specific data processing means, each information object content type specific data processing means including at least intermediate data generating means for generating a piece of intermediate data of a particular content type of a particular linked content item of an information object and display image generating means for generating a display image from the piece of intermediate data of the particular content type of the particular linked content item of the information object.

5. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein said holding means holds in an executable manner a plurality of different data processing means specific to said linked content items of different content types of the information object, each data processing means including corresponding one of said intermediate data generating means for generating a piece of intermediate data for a content type of a particular linked content item of the information object, corresponding one of said

display image generating means, corresponding content data capturing means specific to said content type of the particular linked content item of the information object for capturing content data of said particular content type of the linked content item of the information object, and corresponding intermediate data deleting means specific to said content type of the particular linked content item of the information object for deleting said generated piece of intermediate data in said memory.

6. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein each intermediate data generating means is implemented as program codes, and each display image generating means is implemented as program codes; and

said apparatus further comprises data capturing means for capturing said intermediate data generating program codes and said display image generating program codes into said holding means from an external device or a communication line.

7. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 further comprising:

visual field data managing means for smoothly changing said visual field data according to an input command; and

display means for displaying the generated display images of said particular linked content item of the information object.

8. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 further comprising:

means for assigning a display priority to each of a plurality of linked content items of an information object and changing the display priority of a particular linked content item of an information object based upon the geometric relation between said visual field and said particular linked content item of the information object;

said first means comparing said display priority of a particular linked content item of an information object with a predetermined threshold to thereby determine whether to generate a piece of intermediate data of said particular linked content item of the information object;

said second means comparing said display priority of said particular linked content item of the information object with a predetermined threshold to thereby determine whether to

generate a display image of said particular linked content item of the information object.

9. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein:

said holding means further holds a plurality of different intermediate data deleting means specific to said respective different content types of linked content items of the information object for deleting said respective generated pieces of intermediate data;

said information processing apparatus further comprises managing data for a plurality of linked content items of an information object, and means for assigning display priorities to respective ones of said plurality of linked content items of the information object and changing the display priority of a particular linked content item of an information object based upon the geometric relation between said visual field and said particular linked content item of the information object;

said first means comparing said display priority of a particular linked content item of an information object with a predetermined threshold to thereby determine whether to generate or renew a piece of intermediate data of said particular linked content item of the information object;

said first means causing corresponding one of said intermediate data generating means to generate or renew said piece of intermediate data of said particular linked content item of the information object when the display priority of said particular linked content item of the information object is higher than the predetermined threshold;

said first means causing corresponding one of said data deleting means to delete said piece of intermediate data of said particular linked content item of the information object in said memory when the display priority of said particular linked content item of the information object is lower than a predetermined threshold;

said first means deleting managing data of said particular linked content item of the information object in said memory when the display priority of said particular linked content item of information object is lower than a predetermined threshold.

10. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein each display image generating means determines a form in which a generated display image is displayed, according to a particular linked content item display

priority based upon the geometric relation between said visual field and the particular linked content item .

11. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 wherein display priorities are assigned to respective ones of a plurality of linked content items of an information object, and when a display image of a particular linked content item of the information object is to be displayed, a corresponding one the display image generating means determines a form in which said display image of said particular linked content item of the information object is to be displayed according to a display priority of said particular linked content item of the information object, and

wherein the display priority of a particular linked content item of an information object is changed based upon the geometric relation between said visual field and said particular linked content item of the information object.

12. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 further comprising:

a memory region of said memory for storing therein display data including the pieces of intermediate data for displaying a plurality of linked content items of an information object; and

memory managing means for detecting an amount of said memory region occupied by said display data and time-sequentially deleting from said memory region at least part of the pieces of intermediate data not used for display image generation for a longest time.

13. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 1 further comprising:

third means for selecting, based upon a linked content item display priority, one of a plurality of linked content items of an information object as a representative linked content item of the information object, defining said visual field by defining a geometric relation of said representative linked content item to said visual field, and changing the display priority of the representative linked content item based upon the geometric relation of the representative linked content item to the visual field;

said third means altering said representative linked content item, without changing the geometric relations of said plurality of linked content items of the information object to said visual

field, as said visual field shifts in said virtual space;

said first means traversing linkages between said plurality of linked content items of the information object, starting with said representative linked content item, to thereby determine whether to generate a piece of intermediate data of a particular linked content item of the information object.

14. (PREVIOUSLY PRESENTED) The information processing apparatus according to claim 13 wherein said third means selects one of said plurality of linked content items of the information object having a highest display priority as said representative linked content item.

15. (PREVIOUSLY PRESENTED) A computer readable data storage storing at least one program controlling a computing apparatus for displaying an information object in a virtual space according to visual field data, where the information object represents one or more respective linked content items of different content types, and where said visual field data defines a visual field in said virtual space, according to a process comprising:

storing, in an executable manner, a plurality of programs specific to said respective linked content items of different content types of the information object, each information object linked content item type specific program generating intermediate data specific to a content type of a linked content item of a particular information object, wherein said generated intermediate data comprises at least either of texture data or display form defining data, and each said program generating a display image specific to said linked content item type of the particular information object from said generated intermediate data;

causing the intermediate data to be generated for displaying said particular linked content item of the information object, according to a geometric relation between said visual field and said linked content item of the information object;

a memory for storing the generated intermediate data for rendering a display image; and

causing said particular linked content item of the information object to be displayed from said generated intermediate data, according to the geometric relation between said visual field and said linked content item of the information object, to render the display image on a display memory region.

16. (PREVIOUSLY PRESENTED) The computer readable storage according to

claim 15, wherein the process further comprises asynchronously performing the causing the intermediate data to be generated with the causing the display image to be generated.

17. (PREVIOUSLY PRESENTED) The computer readable storage according to claim 15, wherein the process further comprises performing the causing the intermediate data to be generated or renewed simultaneously with the causing the display image to be generated.

18. (PREVIOUSLY PRESENTED) The computer readable storage according to claim 15 wherein said storing comprises storing, in an executable manner, at least one information object linked content item type specific processing program, said at least one information object linked content item type specific processing program generating the intermediate data of the particular content type of the linked content item of the information object, and generating a display image of the particular content type of the linked content item of the information object.

19. (PREVIOUSLY PRESENTED) The computer readable storage according to claim 15 wherein each information object linked content item type specific program captures information object linked content data of corresponding linked content item type, and deletes intermediate data of said corresponding linked content item type in the memory.

20. (PREVIOUSLY PRESENTED) The computer readable storage according to claim 15 wherein the process further comprises:

assigning display priorities to respective ones of a plurality of linked content items of an information object;

comparing said display priority of said particular linked content item of the information object with a predetermined threshold to determine whether to generate the intermediate data of said particular linked content item of the information object; and

comparing said display priority of said particular linked content item of the information object with a predetermined threshold to determine whether to generate the display image of said particular linked content item of the information object.

21. (PREVIOUSLY PRESENTED) The computer readable storage according to

claim 15 wherein each information object linked content item type specific program deletes said generated intermediate data from said memory; and

said process further comprises:

assigning display priorities to respective ones of a plurality of linked content items of an information object;

comparing said display priority of said particular linked content item information object with a predetermined threshold to determine whether to generate or renew said intermediate data of said particular linked content item information object;

causing said intermediate data of said particular linked content item of the information object to be generated or renewed, when the display priority of said particular linked content item of the information object is higher than the predetermined threshold;

causing said intermediate data of said particular linked content item of the information object in said memory to be deleted, when the display priority of said particular linked content item of the information object is lower than a predetermined threshold.

22. (PREVIOUSLY PRESENTED) The computer readable storage according to claim 15 wherein the process further comprises assigning display priorities to respective ones of a plurality of linked content items of an information object; the generating of the display image comprising, when the display image of said particular linked content item of the information object is to be displayed, determining a form in which said display image of said particular linked content item of the information object is displayed according to the display priority of said particular linked content item of the information object.

23. (PREVIOUSLY PRESENTED) The computer readable storage according to claim 15 wherein the intermediate data generating comprises storing data for display including generated intermediate data for displaying a plurality of linked content items of an information object in said memory, and the process further comprises:

detecting an amount of said memory occupied by said display data; and

sequentially deleting in said memory at least part of the generated intermediate data not used for display image generation for a longest time.

24. (PREVIOUSLY PRESENTED) The computer readable storage according to

claim 15 wherein the process further comprises selecting one of a plurality of linked content items of an information object as a representative linked content item of the information object and defining said visual field by defining a geometric relation of said representative linked content item to said visual field, the selecting comprises altering said representative linked content item without changing the geometric relations of said plurality of linked content items of the information object to said visual field, as said visual field shifts in said virtual space,

wherein said process further comprises traversing linkages between said plurality of linked content items of the information object, starting with said representative linked content item, to cause intermediate data of one of the plurality of linked content items of the information object to be generated.

25. (PREVIOUSLY PRESENTED) A method of displaying, in a computing apparatus, an information object in a virtual space according to visual field data, where the information object represents one or more respective linked content items of different content types, and where said visual field data defines a visual field in said virtual space, said method comprising:

processing data, specific to said respective linked content items of different content types, of the information object, by generating a piece of intermediate data specific to a content type of a particular linked content item of the information object, wherein said generated piece of intermediate data comprises at least either of texture data or display form defining data, and by generating a display image specific to said particular linked content item of the information object from said generated intermediate data;

causing the piece of intermediate data to be generated for displaying said particular linked content item of the information object, according to a geometric relation between said visual field and said particular linked content item of the information object;

storing, in a memory, the generated piece of intermediate data for rendering a display image; and

causing said particular linked content item of the information object to be displayed from said generated intermediate data, according to the geometric relation between said visual field and said particular linked content item of the information object, to render the display image on the display memory region.

26. (PREVIOUSLY PRESENTED) A computing apparatus that displays an

information object in a virtual space according to visual field data, where the information object represents one or more linked content items of different types, and where the visual field data defines a visual field in the virtual space, the apparatus comprising:

a computer readable medium to store a plurality of intermediate data generators, each corresponding to a different linked content item type of an information object to generate display intermediate data of the linked content items of different types of the information object, said generated intermediate data comprising at least either of texture data or display form defining data, and to store a plurality of display image generators, each corresponding to the linked different content item types of the information object to generate display images from corresponding generated display intermediate data of the linked content item types of the information object; and

a controller to control the apparatus according to a process comprising:

controlling one of the intermediate data generators corresponding to a linked content item type of the information object to generate display intermediate data to display a representative linked content item type of the information object, according to a geometric relation between the visual field and representative linked content item of the information object;

rendering a display image on a display memory region, based upon the generated intermediate data; and

controlling one of the display image generators corresponding to the linked content item type of the information object to generate a display image of the linked content item type of the information object from the generated display intermediate data of the linked content item type of the information object, according to the geometric relation between the visual field and the linked content item of the information object, to render the display image on the display memory region.